

AMENDMENTS TO THE CLAIMS

This Listing of Claims will replace all prior versions, and listings, of Claims in the Application:

Listing of Claims:

Claim 1 (currently amended): A method for fabrication of miniature structures, comprising the steps of:

(a) providing a fabrication tool, including:

a substrate having a surface,

an energy beam directed towards said substrate, and

control means operating said fabrication tool in (1) material removal mode of operation and (2) material transfer mode of operation, in a predetermined sequence;

whereby when said fabrication tool is in said material removal mode of operation, further providing a direct access of said energy beam to said surface of said substrate and cleaning said surface of said substrate by changing a relative disposition between said energy beam and said substrate in accordance with a first predetermined pattern; and,

(b) providing a material carrier element having a deposition layer

supported thereon and facing said substrate, whereby when said fabrication tool is in said

material transfer mode of operation further including positioning said deposition layer in an interception path with said energy beam, and

changing a relative disposition between said energetic beam and said substrate in accordance with said first predetermined pattern, thereby transferring a deposition material contained in said deposition layer on said surface of said substrate at locations thereon cleaned during said material removal mode of operation.

Claim 2 (canceled).

Claim 3 (Currently Amended): The method of Claim ~~2~~1, further comprising the steps of:

changing the mode of operation of said fabrication tool to a successive material removal mode of operation following said material transfer mode of operation, and

cleaning the surface of said substrate by changing relative disposition between said energy beam and said substrate in accordance with a second predetermined pattern.

Claim 4 (Original): The method of Claim 3, wherein said second predetermined pattern differs from said first predetermined pattern.

Claim 5 (Original): The method of Claim 3, wherein the surface of said substrate has said deposition material deposited thereon.

Claim 6 (Original): The method of Claim 1, wherein said energy beam includes a laser beam.

Claim 7 (Original): The method of Claim 6, wherein said laser beam includes an ultraviolet laser beam.

Claim 8 (currently amended): The method of Claim 21, further including the steps of:

displacing said material carrier element away from interception with said energy beam in said material removal mode of operation.

Claim 9 (currently amended): The method of Claim 21, further including the steps of:

maintaining said deposition layer in a position intercepting with said energy beam in said material transfer mode of operation.

Claim 10 (Original): The method of Claim 3, further including the steps of:
changing the relative disposition between said energetic beam and said substrate by controlling the position of said energy beam relative to said substrate.

Claim 11 (Original): The method of Claim 3, further including the steps of:
changing the relative disposition between said energy beam and said substrate by controlling the position of said substrate relative to said energy beam.

Claim 12 (Original): The method of Claim 3, further including the step of:
changing the relative disposition between said energetic beam and said substrate by controlling the positions of said energy beam and said substrate in coordinated fashion.

Claim 13 (Original): The method of Claim 3, in said “material removal” modes of operation, supplying a carrier gas flowing through said fabrication tool to remove residues formed as the result of said cleaning of said substrate surface.

Claim 14 (Original): The method of Claim 3, further including the steps of:
supplying an inert cover gas flowing through said fabrication tool to prevent areas of said substrate surface freshly exposed during said cleaning of said substrate surface from the re-oxidation.

Claim 15 (Original): The method of Claim 1, wherein said substrate surface includes at least one material to be removed therefrom, said method further comprising the step of:

adjusting, by means of said control means, intensity of said energy beam for removing said at least one material.

Claim 16 (Original): The method of Claim 1, wherein said substrate surface includes a plurality of different materials to be removed therefrom, said method further comprising the steps of:

adjusting, by means of said control means, intensity of said energy beam in accordance with positions of said materials to be removed from said substrate surface.

Claim 17 (currently amended): A method of patterned cleaning of a substrate surface, comprising the steps of:

(a) providing a fabrication tool, including:

a substrate having a surface thereof,

an energy beam directed towards said substrate, and

control means operating said fabrication tool in either a material removal mode of operation and a material transfer mode of operation whereby in said material removal mode of ~~operation~~ operation further performing a first cleaning of said substrate surface by allowing a direct access for said energy beam to said substrate surface and by changing a relative disposition between said energy beam and said substrate in accordance with a first predetermined pattern, ~~and;~~

(b) performing a second cleaning of said substrate surface by allowing a direct access for said energetic beam to said substrate surface and by changing a relative disposition between said energy beam and said substrate in accordance with a second predetermined pattern; and,

(c) providing a material carrier element having a deposition layer supported thereon and facing said substrate,

between said first and second cleaning steps, positioning said material carrier element into interception with said energy beam, thereby translating said fabrication tool into said material transfer mode of operation, and

changing relative disposition between said energetic beam and said substrate in accordance with said first predetermined pattern, thereby depositing a deposition material contained in said deposition layer onto said substrate surface at locations therein cleaned during said first cleaning.

Claim 18 (canceled).

Claim 19 (Original): The method of Claim 17, wherein said second cleaning is performed on said substrate surface including at least one deposited structure.

Claim 20 (currently amended): An apparatus for patterned cleaning of a substrate surface, comprising:

- a substrate having a surface thereof,
- an energy beam directed towards said substrate, and
- control means operating said apparatus in either a material removal mode of operation and material transfer mode of operation,

in said material removal mode of operation, said control means change the relative disposition between said energy beam and said substrate in accordance with a predetermined pattern, thus cleaning said substrate surface in a patterned fashion; and, a material carrier element positionable in interception with said energy beam in said material transfer mode of operation and away from interception with said energetic beam in said material removal mode of operation, said material carrier element including a deposition layer supported thereon and facing said substrate.

Claim 21 (Original): The apparatus of Claim 20, wherein said energy beam includes a laser beam.

Claim 22 (Original): The apparatus of Claim 21, wherein said laser beam includes a pulsed ultraviolet beam.

Claim 23 (Original): The apparatus of Claim 20, wherein said energy beam includes an electron beam.

Claim 24 (Original): The apparatus of Claim 20, wherein said energy beam includes an ion beam.

Claim 25 (canceled),

Claim 26 (Original): The apparatus of Claim 20, wherein said control means further includes means for adjusting intensity of said energy beam in accordance with a type of material on said substrate surface.

Claim 27 (Original): The apparatus of Claim 21, wherein said substrate surface has a plurality of material disposed thereon, said adjusting means being adapted for adjusting the intensity of said energy beam in accordance with position of each of said plurality of materials.

Claim 28 (Original): The apparatus of Claim 20, further including means for supplying a carrier gas flowing through said apparatus for removing therefrom residues formed during said surface cleaning.

Claim 29 (Original): The apparatus of Claim 20, further including means for supplying an inert cover gas flowing through said apparatus for preventing reoxidation of areas on said substrate surface freshly exposed during said cleaning.

Claim 30 (Original): The apparatus of Claim 20, wherein said control means is operatively coupled to said energy beam to change the position thereof with respect to said substrate.

Claim 31 (Original): The apparatus of Claim 20, wherein said control means is operatively coupled to said substrate to change the position thereof with respect to said energy beam.

Claim 32 (Currently Amended): The apparatus of Claim ~~25~~20, wherein said control means is operatively coupled to said material carrier element for changing the position thereof, thus setting said apparatus in one of said material removal and said material transfer modes of operation.

Claim 33 (Original): The apparatus of Claim 20, wherein said control means operates said apparatus in either of said material removal and material transfer modes of operation in a predetermined sequence.